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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,394	04/19/2004	Eunice Poon	EETP017	3116
20178 7590 03/20/2009 EPSON RESEARCH AND DEVELOPMENT INC INTELLECTUAL PROPERTY DEPT 2580 ORCHARD PARKWAY, SUITE 225 SAN JOSE, CA 95131			EXAMINER VANCHY JR, MICHAEL J	
			ART UNIT 2624	PAPER NUMBER
			MAIL DATE 03/20/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/827,394

Applicant(s)

POON, EUNICE

Examiner

MICHAEL VANCHY JR

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17, 19-31, 33 and 34 is/are rejected.
- 7) ☒ Claim(s) 18, 32 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed November 18, 2008, have been fully considered but they are not persuasive.
2. Regarding the arguments filed on November 18, 2008 the Examiner respectfully disagrees and hopefully can clear up any miscommunication. Schroeder et al., 3,627,920, teaches generating an initial image (guess image), based upon the parameters ascertained from the motion blurred image (such as blur direction and extent), and then compares the "guess image" with the motion blurred image to receive an output image (col. 1, lines 34-45). This output image from Schroeder is the "error image," even though it is not explicitly stated. This output image is expected to be completely corrected for blur, but as is known by the Applicant and is discussed in "Identification of Blur Parameters from Motion Blurred Images," by Y. Yatzhaky and N. S. Kopeika, the output image can have restoration errors. These errors can be further used to establish blur extent again (which then is used to blur and weight or filter) the error image (1. Introduction and 2.1 Formation of a Shadowed Image). Using the combined information from the initial image (guess image) and the original output in Schroeder (the error image), and then taking the output from Schroeder and determining the restoration errors formed, and finally combining the new error image with the original guess image enables a more precise final output image that has been corrected from motion blur. Therefore, taking the broadest reasonable interpretation of

the claim language, the obvious combination of Schroeder and Yatzhaky teaches the independent claims as written.

3. The rejections under 35 U.S.C. 112 have been withdrawn in response to Applicant's amendment.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claims 1, 2, 5, 7-11, 14, 19, 20, 23-28, 33, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder et al., 3,627,920 and further in view of "Identification of Blur Parameters from Motion Blurred Images," by Y. Yatzhaky and N. S. Kopeika.**

Regarding claim 1, Schroeder, teaches generating an initial image (guess image), based upon the parameters ascertained from the motion blurred image (such as

blur direction and extent), and then compares the "guess image" with the motion blurred image to receive an output image (col. 1, lines 34-45). This output image from Schroeder is the "error image," even though it is not explicitly stated. This output image is expected to be completely corrected for blur, but as is known by the Applicant and is discussed in "Identification of Blur Parameters from Motion Blurred Images," by Y. Yatzhaky and N. S. Kopeika, the output image can have restoration errors. These errors can be further used to establish blur extent again (which then is used to blur and weight or filter) the error image (1. Introduction and 2.1 Formation of a Shadowed Image). It would be clear to one of ordinary skill in the art at the time of the invention to use the combined information from the initial image (guess image) and the original output in Schroeder (the error image), and then modifying Schroeder to take the output image and determine the restoration errors formed, and finally combining the new error image with the original guess image for a more precise final output image that has been corrected for motion blur.

Regarding claim 2, Schroeder teaches wherein said weighting is a function of the blur direction (Abstract and col. 1, lines 34-45).

Regarding claim 5, Schroeder teaches wherein said initial guess image is said motion blurred image (Abstract).

Regarding claims 7-10, Schroeder teaches using an iterative method based upon different parameters for correcting of motion blur as claimed by the applicant (Fig. 3, col. 7, lines 12-36)

Regarding claim 11, Yitzhaky teaches wherein prior to performing said method said blur extent is compared with a threshold blur extent level, said method being performed only when the estimate of the motion blur extent is greater than said threshold blur extent level (2.1 *Characterization of the Blur Effect*, the examiner takes into account that the threshold is used as a minimum in this case.).

Regarding claim 14, Schroeder, teaches generating an initial image (guess image), based upon the parameters ascertained from the motion blurred image (such as blur direction and extent), and then compares the "guess image" with the motion blurred image to receive an output image (col. 1, lines 34-45). This output image from Schroeder is the "error image," even though it is not explicitly stated. This output image is expected to be completely corrected for blur, but as is known by the Applicant and is discussed in "Identification of Blur Parameters from Motion Blurred Images," by Y. Yatzhaky and N. S. Kopeika, the output image can have restoration errors. These errors can be further used to establish blur extent again (which then is used to blur and weight or filter) the error image (1. Introduction and 2.1 Formation of a Shadowed Image). It would be clear to one of ordinary skill in the art at the time of the invention to use the combined information from the initial image (guess image) and the original output in Schroeder (the error image), and then modifying Schroeder to take the output image and determine the restoration errors formed, and finally combining the new error image with the original guess image for a more precise final output image that has been corrected for motion blur.

Yitzhaky teaches estimating the direction of blur in said motion blurred image based on edge response of said motion blurred image over a set of discrete directions extending through said motion blurred image and over subgroups of said discrete directions (1. Introduction and 2.4 *Formulation of the Method*).

Regarding claim 19, Schroeder teaches weighting said error image prior to said combining to inhibit blur correction from occurring in areas not requiring blur correction (Abstract and col. 1, lines 34-45).

Regarding claim 20, see the rejection made to claim 2, for it addresses all the limitations within this claim.

Regarding claim 23, see the rejection made to claim 5, for it addresses all the limitations within this claim.

Regarding claim 24, see the rejection made to claim 7, for it addresses all the limitations within this claim.

Regarding claim 25, see the rejection made to claim 8, for it addresses all the limitations within this claim.

Regarding claim 26, see the rejection made to claim 9, for it addresses all the limitations within this claim.

Regarding claim 27, see the rejection made to claim 10, for it addresses all the limitations within this claim.

Regarding claim 28, see the rejection made to claim 11, for it addresses all the limitations within this claim.

Regarding claims 33 and 34, Yitzhaky teaches wherein said blur extent is estimated using a correlation based method (*2.2 Application to a Real Image*).

4. Claims 3, 4, 6, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder et al., 3,627,920 and “Identification of Blur Parameters from Motion Blurred Images,” by Y. Yatzhaky and N. S. Kopeika and further in view of “Direct method for Restoration of motion-blurred images,” by Yitzhaky, Mor, Lantzman, and Kopeika (further referred to as Mor).

Regarding claims 3-6, Schroeder and Yitzhaky teach a method for motion blur correction, however, they do not explicitly state where said weighting is an estimate of edge magnitude using a high pass filter. Mor teaches using edge magnitude and using a high pass filter to determine the edge magnitude (B. Identification of the Blur Direction). It would be clear to one of ordinary skill in the art at the time of the invention to modify Schroeder and Yitzhaky to include a high pass filter for edge magnitude identification so that a more precise identification of the blur can be computed.

Regarding claims 12 and 13, see the rejection made to claim 6, for it addresses all the limitations within this claim.

Regarding claim 21, see the rejection made to claim 3, for it addresses all the limitations within this claim.

Regarding claim 22, see the rejection made to claim 4, for it addresses all the limitations within this claim.

5. **Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schroeder et al., 3,627,920 and "Identification of Blur Parameters from Motion Blurred Images," by Y. Yitzhaky and N. S. Kopeika and further in view of "Local Scale Control for Edge Detection and Blur Estimation," by Elder and Zucker.**

Regarding claim 15, Schroeder and Yitzhaky teach a method for correcting a motion blurred image, however neither explicitly teach said discrete directions being angularly spaced over angular space. Elder teaches wherein said set of discrete directions includes N discrete directions, said discrete directions being angularly spaced over the angular space of said motion blurred image between 0 and 180 degrees (10 Implementation on a Discrete Grid and Fig. 6(c)). It would be clear to one of ordinary skill in the art to modify Schroeder and Yitzhaky at the time of the invention to include the specific directions for a more accurate identification of the motion blur direction.

Regarding claim 16, Elder teaches wherein said discrete directions are equi-angularly spaced and wherein N is an even number (10 Implementation on a Discrete Grid and Fig. 6(c)).

Regarding claim 17, Elder teaches wherein during said blur direction estimating the edge response over a plurality of subgroup combinations of discrete directions is determined and compared with the edge response over the set of discrete directions, each subgroup combination partitioning said set of discrete directions into a pair of quadrants, with discrete directions in at least one of said quadrants being consecutive (10 Implementation on a Discrete Grid and Fig. 6(c)).

Regarding claim 29, see the rejection made to claim 15, for it addresses all the limitations within this claim.

Regarding claim 30, see the rejection made to claim 16, for it addresses all the limitations within this claim.

Regarding claim 31, see the rejection made to claim 17, for it addresses all the limitations within this claim.

Allowable Subject Matter

6. Claims 18, 32 and 35 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL VANCHY JR whose telephone number is (571)270-1193. The examiner can normally be reached on Monday - Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on (571) 272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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